AMENDMENTS TO THE CLAIMS

Claim 1. (Original)

A clutch controller of a mechanical automatic transmission which enables automatic transmission operation by means of providing a transmission gear mechanism with an actuator and a clutch mechanism with an actuator, the controller comprising:

engine speed detection means for detecting an engine speed;

accelerator position detection means for detecting the position of an accelerator;

range setting means for setting an engine speed range in which engine output torque falls within a predetermined range including a maximum value at the position of said accelerator detected by said accelerator position detection means; and

control means which effects direct engagement of a clutch when a vehicle is pulled away while controlling a connected state of said clutch such that the engine speed detected by said engine speed detection means falls within said engine speed range set by said range setting means.

Claim 2. (Original)

The clutch controller of the mechanical automatic transmission according to claim 1, wherein said range setting means sets a first threshold value at an engine speed lower than an engine speed at which said engine output torque becomes maximum at said position of said accelerator and sets a second threshold value at an engine speed higher than said engine speed, thereby setting said engine speed range.

Claim 3. (Original)

The clutch controller of the mechanical automatic transmission according to claim 2, wherein said first threshold value and said second threshold value are set in accordance with said position of said accelerator.

Claim 4. (Original)

The clutch controller of the mechanical automatic transmission according to claim 2, wherein said control means comprises

a storage section for storing a map in which clutch stroke speeds corresponding to a rate of change in said engine speed are set with regard to three ranges; namely, a first range which is lower in engine speed than said first threshold value, a second range falling between said first threshold value and said second threshold value, and a third range higher in engine speed than said second threshold value;

a determination section for determining which one of said three ranges that said engine speed detected by said engine speed detection means falls within; and

a clutch control section which selects from said map a clutch stroke speed corresponding to the range determined by said determination section and controls said clutch stroke speed of said clutch.

Claim 5. (Original)

The clutch controller of the mechanical automatic transmission defined in claim 4, wherein said storage section stores, as said map, control lines corresponding to said three ranges on coordinates formed from the rate of change in said engine speed and said clutch stroke speed;

said control line of the second range is set so as to increase said clutch stroke speed in a clutch engagement direction when the rate of change in said engine speed has increased and to increase said clutch stroke speed in a clutch disengagement direction when the rate of said engine speed has decreased; and

said control line of said first range is a line obtained as a result of said control line in said second range having been shifted toward an increase in the rate of change in said engine speed, and said control line of said third range is a line obtained as a result of said control line of said second range having been shifted toward a decrease in the rate of change in said engine speed.

Claim 6. (Original)

The clutch controller of the mechanical automatic transmission defined in claim 4, wherein

said storage section stores a map in which are set clutch stroke speeds corresponding to the rate of change in said engine speed in connection with a plurality of ranges into which said first range has been divided;

said determination section determines which one of said plurality of ranges within said first range includes said engine speed detected by said engine speed detection means when said detected engine speed falls within said first range; and

said clutch control section controls said clutch stroke speed of said clutch by means of selecting, from said map, a clutch stroke speed corresponding to said range determined by said determination section.

Claim 7. (Original)

The clutch controller of the mechanical automatic transmission defined in claim 6, wherein said storage section stores, as said map, sub-control lines corresponding to said plurality of ranges within said first range on coordinates formed from the rate of change in engine speed and said clutch stroke speed; and

said sub-control lines assigned to said plurality of ranges within said first range are formed by shifting at intervals said control line of said second range toward an increase in the rate of said engine speed.

Claim 8. (Original)

The clutch controller of the mechanical automatic transmission defined in claim 4, wherein

said storage section stores a map in which are set clutch stroke speeds corresponding to the rate of change in said engine speed in connection with a plurality of ranges into which said third range has been divided;

said determination section determines which one of said plurality of ranges within said third range includes said engine speed detected by said engine speed detection means when said detected engine speed falls within said third range; and

said clutch control section controls said clutch stroke speed of said clutch by means of selecting, from said map, a clutch stroke speed corresponding to said range determined by said determination section.

Claim 9. (Original)

The clutch controller of the mechanical automatic transmission defined in claim 6, wherein

said storage section stores a map in which are set clutch stroke speeds corresponding to the rate of change in said engine speed in connection with a plurality of ranges into which said third range has been divided;

said determination section determines which one of said plurality of ranges within said third range includes said engine speed detected by said engine speed detection means when said detected engine speed falls within said third range; and

said clutch control section controls said clutch stroke speed of said clutch by means of selecting, from said map, a clutch stroke speed corresponding to said range determined by said determination section.

Claim 10. (Original)

The clutch controller of the mechanical automatic transmission defined in claim 8, wherein said storage section stores, as said map, sub-control lines corresponding to said plurality of ranges within said third range on coordinates formed from the rate of change in engine speed and said clutch stroke speed; and

said sub-control lines assigned to said plurality of ranges within said third range are formed by shifting at intervals said control line of said second range toward a decrease in the rate of said engine speed.

Claim 11. (Original)

The clutch controller of the mechanical automatic transmission defined in claim 9, wherein said storage section stores, as said map, sub-control lines corresponding to said plurality of ranges within said third range on coordinates formed from the rate of change in engine speed and said clutch stroke speed; and

said sub-control lines assigned to said plurality of ranges within said third range are formed by shifting at intervals said control line of said second range toward a decrease in the rate of said engine speed.

Claim 12. (Original)

A method for controlling a clutch of a mechanical automatic transmission which enables automatic transmission operation by means of providing a transmission gear mechanism with an actuator and a clutch mechanism with an actuator, the method comprising the steps of:

detecting an engine speed and the position of an accelerator;

setting a first threshold value at an engine speed lower than an engine speed at which said engine output torque becomes maximum at said detected position of said accelerator and setting a second threshold value at an engine speed higher than said engine speed; and

effecting direct engagement of said clutch while controlling a connected state of said clutch such that said detected engine speed falls between said set first threshold value and said second threshold value.

Claim 13. (Original)

The method for controlling a clutch of a mechanical automatic transmission according to claim 12, wherein, when said detected engine speed is lower than said first threshold value, said clutch is controlled so as to be disengaged; and, when said detected engine speed is higher than said second threshold value, said clutch is controlled so as to be engaged.

Claim 14. (Original)

The method for controlling a clutch of a mechanical automatic transmission according to claim 12, wherein a low engine speed sub-threshold value is set at an engine speed which is lower than said first threshold value; and, when said detected engine speed is lower than said engine speed sub-threshold value, a clutch stroke speed is increased toward said clutch disengagement direction as compared with a case where said detected engine speed falls between said first threshold value and said low engine speed sub-threshold value.

Claim 15. (Original)

The method for controlling a clutch of a mechanical automatic transmission according to claim 14, wherein a plurality of said low engine speed sub-threshold values are set at engine speeds

lower than said first threshold value; and, when said detected engine speed falls between an (n+1)th (n; natural number) low engine speed sub-threshold value and an (n+2)th low engine speed sub-threshold value toward a lower engine speed from said first threshold value, said clutch stroke speed is increased toward said clutch disengagement direction as compared with a case where said detected engine speed falls between an nth low engine speed sub-threshold value and said (n+1)th low engine speed sub-threshold value.

Claim 16. (Currently Amended)

The method for controlling a clutch of a mechanical automatic transmission according to claim 12, wherein a high engine speed sub-threshold value is set at an engine speed higher than said second threshold value; and, when said detected engine speed is higher than said high engine speed sub-threshold value, said clutch stroke speed is increased toward said clutch engagement direction as compared with a case where said detected engine speed falls between said second ~~first~~ threshold value and said high engine speed sub-threshold value.

Claim 17. (Currently Amended)

The method for controlling a clutch of a mechanical automatic transmission according to claim 14, wherein a high engine speed sub-threshold value is set at an engine speed higher than said second threshold value; and, when said detected engine speed is higher than said high engine speed sub-threshold value, said clutch stroke speed is increased toward said clutch engagement direction

as compared with a case where said detected engine speed falls between said second ~~first~~ threshold value and said high engine speed sub-threshold value.

Claim 18. (Currently Amended)

The method for controlling a clutch of a mechanical automatic transmission according to claim 16, wherein a plurality of said high engine speed sub-threshold values are set at engine speeds higher than said second ~~first~~ threshold value; and, when said detected engine speed falls between an (n+1)th (n; natural number) high engine speed sub-threshold value and an (n+2)th high engine speed sub-threshold value toward a higher engine speed from said second ~~first~~ threshold value, said clutch stroke speed is increased toward said clutch engagement direction as compared with a case where said detected engine speed falls between an nth high engine speed sub-threshold value and said (n+1)th high engine speed sub-threshold value.

Claim 19. (Currently Amended)

The method for controlling a clutch of a mechanical automatic transmission according to claim 17, wherein a plurality of said high engine speed sub-threshold values are set at engine speeds higher than said second ~~first~~ threshold value; and, when said detected engine speed falls between an (n+1)th (n; natural number) high engine speed sub-threshold value and an (n+2)th high engine speed sub-threshold value toward a higher engine speed from said second ~~first~~ threshold value, said clutch stroke speed is increased toward said clutch engagement direction as compared with a case

where said detected engine speed falls between an nth high engine speed sub-threshold value and said (n+1)th high engine speed sub-threshold value.